

INSTRUCTION MANUAL



DATA EAST USA, INC.

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780-0019-00

WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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COMMANDO[©]

GAME PLAY

YOU ARE ABOUT TO BEGIN A HIGHLY SECRET MISSION

You are a crack soldier with special training. You have been given a highly secret mission, and are about to enter into fierce guerrilla warfare! The mission is to annihilate the enemy and to rescue important captives. To do this you must destroy the enemy base, which is said to be impregnable.

The battles you will fight take place in several areas requiring various attack techniques. Your weapons consist of a machine gun with unlimited shots, and a limited supply of hand grenades, which you may replenish by taking from the enemy.

GOOD LUCK!

- * Use JOYSTICK to maneuver the soldier.
- * Use RIGHT BUTTON to fire Machine gun.
- * Use LEFT BUTTON to hurl hand grenades.
- * Dodge all bullets and grenades. Do not collide with enemy soldiers!
- * Destroy as many of the enemy as possible.
- * Pick up enemy grenades (one grenade per box) and use them against the enemy.
- * Extra 'lives' are awarded for exceeding certain scores.
- * Score higher points by destroying enemy leaders and enemy headquarters.
- * Score bonus points by rescuing captives.
- * The arch bridge is a dangerous spot! Watch for attacks from above!
- * Be careful of trucks and jeeps that may try to ram you!
- * Do not fall into rivers or ponds.
- * Trees, walls and other obstacles can be used for cover.

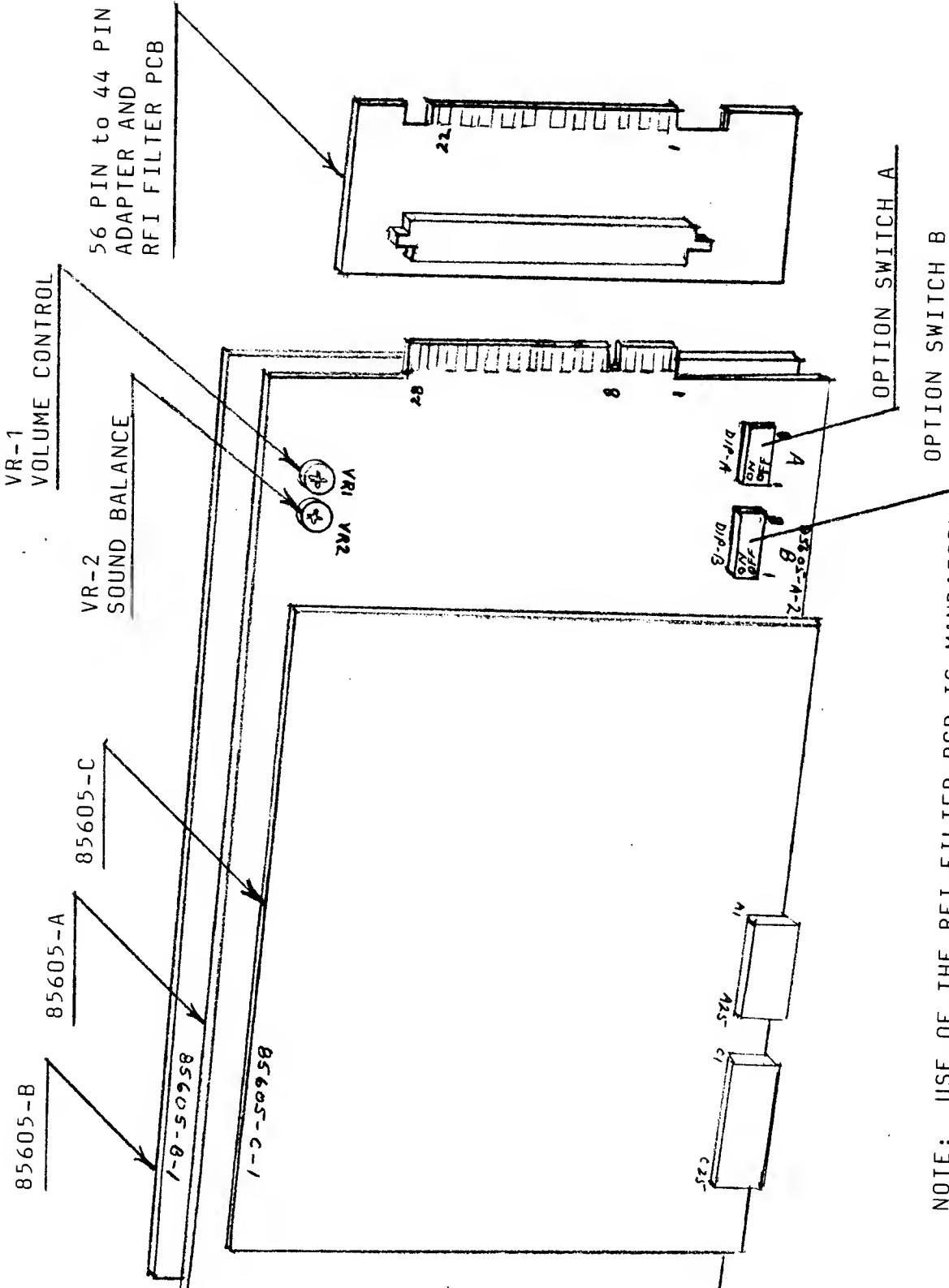
SWITCH A

[illegible]

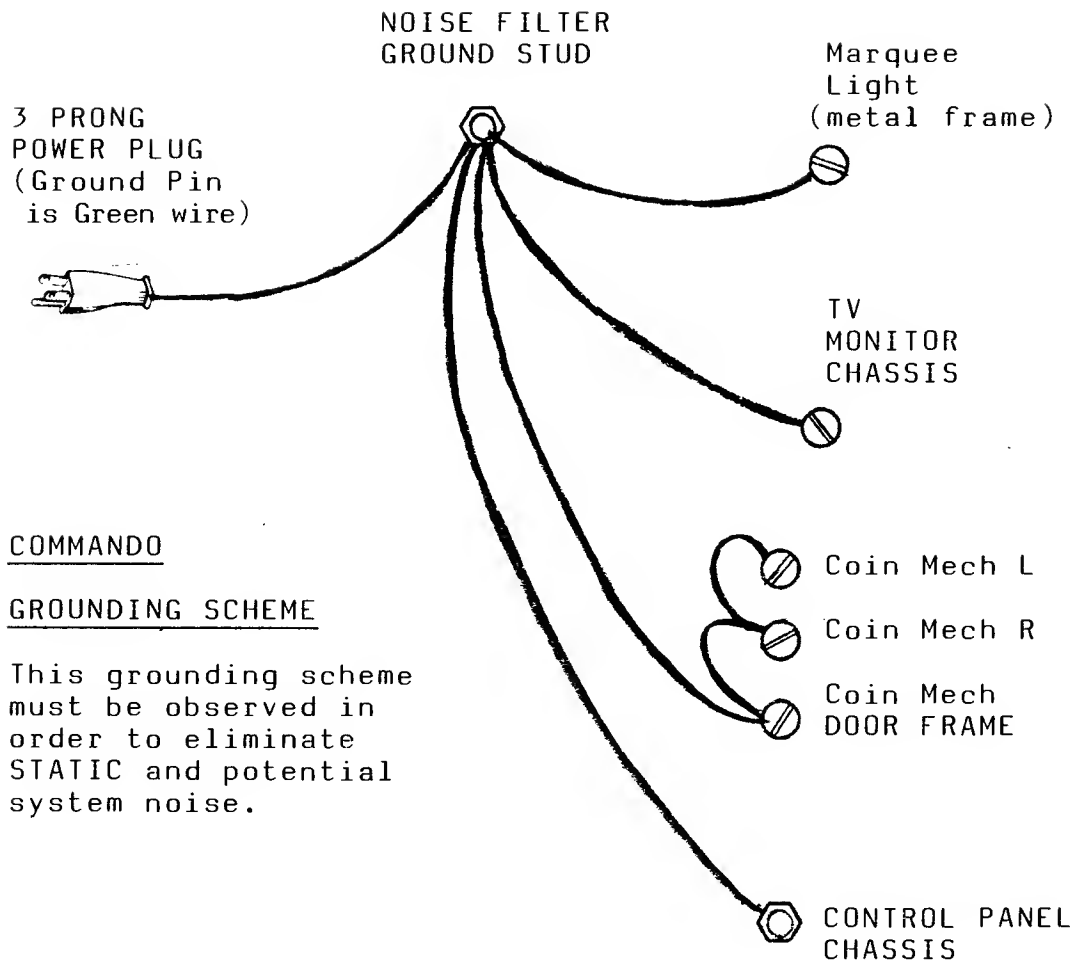
SWITCH B

| OPTION | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|------------------------|-----------|-----|-----------|-----------|-----------|-----|-----|-----|
| COCKTAIL TABLE UPRIGHT | | OFF ON | | | | | | | |
| JOYSTICK 2 WAY | | ON | OFF | | | | | | |
| JOYSTICK 1 WAY | | ON | ON | | | | | | |
| MONITOR REVERSE SWITCH | | | | OFF ON | | | | | |
| DIFFICULTY | NORMAL DIFFICULT | | | | OFF ON | | | | |
| ATTRACT MODE | SOUND ON SOUND OFF | | | | | OFF ON | | | |
| BONUS 'LIFE' AWARD | 10,000 & after 50,000 | | | | | | OFF | OFF | OFF |
| | 10,000 & after 60,000 | | | | | | ON | OFF | OFF |
| | 20,000 & after 60,000 | | | | | | OFF | ON | OFF |
| | 20,000 & after 70,000 | | | | | | ON | ON | OFF |
| | 30,000 & after 70,000 | | | | | | OFF | OFF | ON |
| | 30,000 & after 80,000 | | | | | | ON | OFF | ON |
| | 40,000 & after 100,000 | | | | | | OFF | ON | ON |
| | NO BONUS LIVES GIVEN | | | | | | ON | ON | ON |

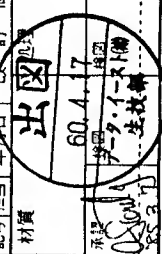
C O M M A N D O



NOTE: USE OF THE RFI FILTER PCB IS MANDATORY
IN ORDER TO PREVENT UNDESIRABLE RADIO
FREQUENCY INTERFERENCE. DO NOT ATTEMPT
TO BYPASS THIS FILTER! NO RFI SHIELD
IS NECESSARY.



1. Ground wire of 3 prong power plug to be connected to Ground Stud on Noise Filter.
2. Marquee Light metal frame to be connected to ground stud on Noise Filter.
3. TV Monitor Chassis to be connected to ground stud on Noise Filter.
4. Coin Mech L, Coin Mech R and Coin Mech Door Frame to be connected to ground stud on Noise Filter.
5. Control Panel Chassis to be connected to ground stud on Noise Filter.
6. All connections must have good mechanical & electrical bond.
7. All connections to be made with #18 or larger green wire.



| SOLDER SIDE | | | COMPONENT SIDE |
|-------------|-------------|---|----------------|
| GND | A | 1 | GND |
| GND | B | 2 | GND |
| +5 | C | 3 | +5 |
| +5 | D | 4 | +5 |
| ⓖ | E | 5 | Ⓡ |
| SYNC. | F | 6 | ⓑ |
| GND | H | 7 | GND |
| KEYWAY | | J | 8 |
| 2P | SHOT 2 | K | 9 |
| | SHOT 1 | L | 10 |
| | UP 1 | M | 11 |
| | DOWN 1 | N | 12 |
| | LEFT 1 | P | 13 |
| | RIGHT 1 | R | 14 |
| | GND | S | 15 |
| | 2P SELECT | T | 16 |
| | (D5) | U | 17 |
| | COIN 2 | V | 18 |
| | GND | W | 19 |
| | | X | 20 |
| | | Y | 21 |
| | +12V COMMON | Z | 22 |
| | COUNTER 2 | a | 23 |
| | SP ⊖ | b | 24 |
| | +12 | c | 25 |
| | GND (12V) | d | 26 |
| | GND | e | 27 |
| | GND | f | 28 |

SHOT 2
SHOT 1
UP 1
DOWN 1
LEFT 1
RIGHT 1
IP

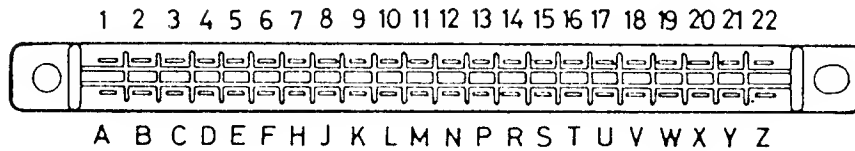
CONNECTOR TYPES
CR7E - 56DA - 3.96E : HIROSE
OF
1168 - 056 - 009 : KEL

| | |
|----------------|----------------|
| EDGE CONNECTOR | 85605—追資-1—1/2 |
|----------------|----------------|

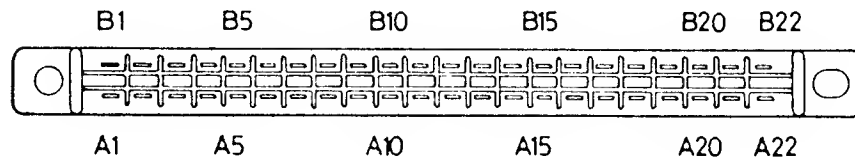
C O M M A N D O

56 PIN TO 44 PIN ADAPTOR & RFI FILTER PCB MAIN HARNESS CONNECTIONS

a) CONNECTOR CR7E-44DA-3.96E (HIROSE) 3.96mm



b) CONNECTOR 1168-044-009 (KEL) 3.96mm



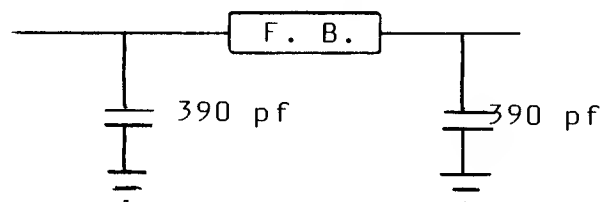
56 PIN to 44 PIN ADAPTER AND RFI FILTER PCB MAIN HARNESS CONNECTIONS

| COMPONENT SIDE | | | SOLDER SIDE | | |
|----------------|-----|----------------|-------------|-----|----------------|
| Pin Nos | | Signal | Pin Nos | | Signal |
| | KEL | | | KEL | |
| 1 | B1 | 1P DOWN | A | A1 | 2P DOWN |
| 2 | B2 | 1P UP | B | A2 | 2P UP |
| 3 | B3 | 1P LEFT | C | A3 | 2P LEFT |
| 4 | B4 | 1P RIGHT | D | A4 | 2P RIGHT |
| 5 | B5 | | E | A5 | |
| 6 | B6 | | F | A6 | |
| 7 | B7 | | H | A7 | |
| 8 | B8 | | J | A8 | |
| 9 | B9 | 1P SHOOT 1 | K | A9 | 2P SHOOT 1 |
| 10 | B10 | 1P SHOOT 2 | L | A10 | 2P SHOOT 2 |
| 11 | B11 | 1P GAME SELECT | M | A11 | 2P GAME SELECT |
| 12 | B12 | COIN 1 | N | A12 | COIN 2 |
| 13 | B13 | COIN COUNTER 1 | P | A13 | COIN COUNTER 2 |
| 14 | B14 | TV.B | R | A14 | TV.G |
| 15 | B15 | SYNC. | S | A15 | TV.R |
| 16 | B16 | | T | A16 | |
| 17 | B17 | SPEAKER + | U | A17 | SPEAKER - |
| 18 | B18 | +12V | V | A18 | |
| 19 | B19 | +5V | W | A19 | +5V |
| 20 | B20 | +5V | X | A20 | +5V |
| 21 | B21 | TV.GND | Y | A21 | GND |
| 22 | B22 | GND | Z | A22 | GND |

56 PIN to 44 PIN ADAPTER & RFI FILTER PCB

The COMMANDO game was developed by CAPCOM CO. Ltd., who also produces the PC Board. The game developer has made no provision for compliance with Federal Communication Commission Rules and Regulations regarding Radio Frequency Interference generated by Class A computing devices. In order to ensure compliance with those regulations, DATA EAST has designed adequate RFI Filtering into the adapter PC Board. This PCB also serves as the interface between the COMMANDO 56 pin edge connector and the DATA EAST 44 pin connector.

All signals and voltages entering or leaving the COMMANDO PCB pass through a 'PI' filter network, with the exception of the ground connections and the R,G,B, & Sync signals for the Monitor, which are routed through a ferrite bead, in order to suppress unwanted radiation. Refer to the pin-out tables on pages 6 and 7 for guidance in tracing signals through this Adapter/Filter PCB.



TYPICAL FILTER NETWORK

CN - 2

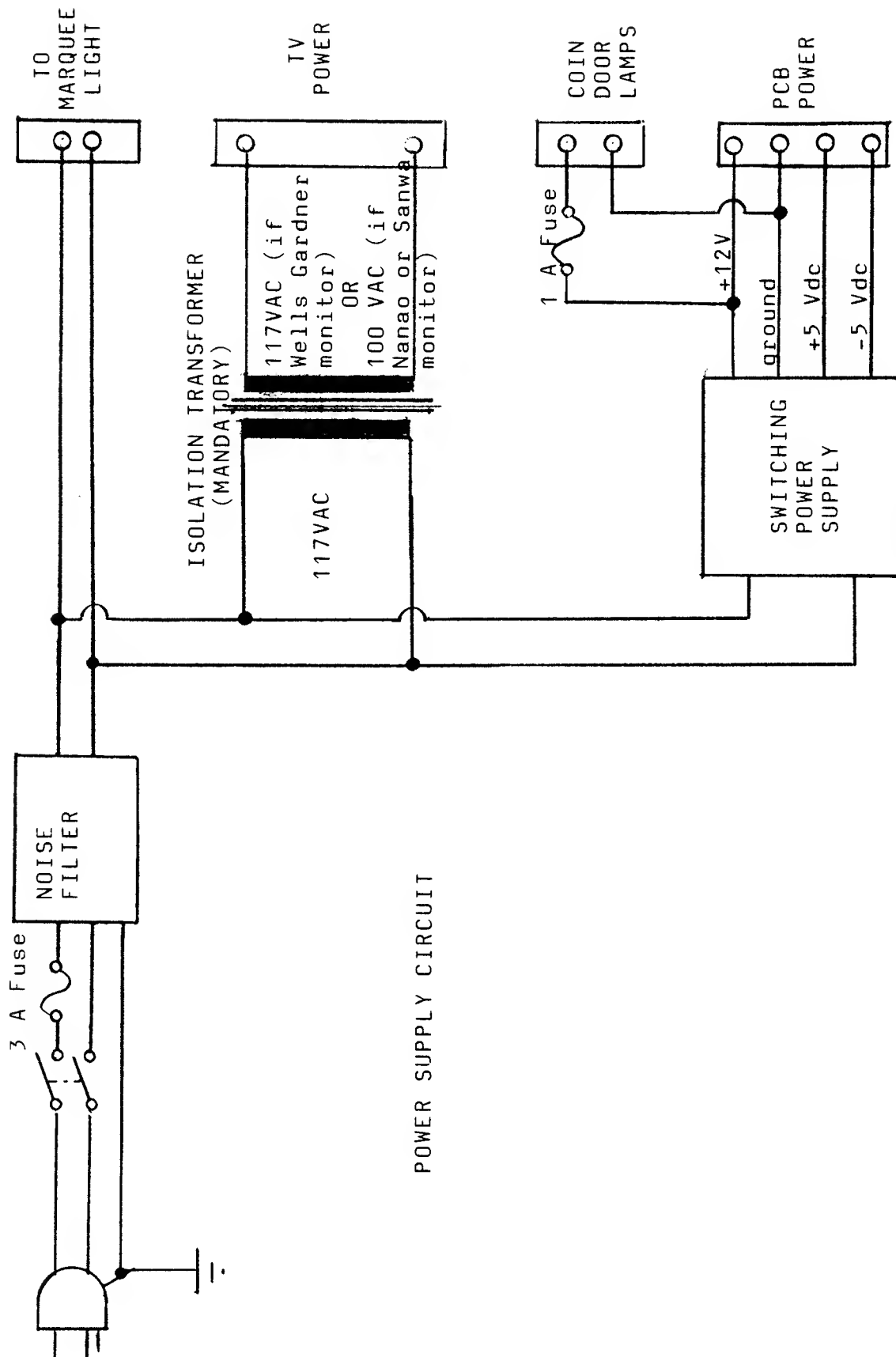
| D | | C |
|-------|----|-------|
| SCR B | 1 | SCR C |
| FLIP | 2 | SCR A |
| OH | 3 | 6M |
| 4H | 4 | 4-3H |
| H2 | 5 | H1 |
| H8 | 6 | H4 |
| H32 | 7 | H16 |
| H128 | 8 | H64 |
| LHBL | 9 | H256 |
| V2 | 10 | V1 |
| V8 | 11 | V4 |
| V32 | 12 | V16 |
| V128 | 13 | V64 |
| OBJ G | 14 | OBJ H |
| OBJ E | 15 | OBJ F |
| OBJ C | 16 | OBJ D |
| OBJ A | 17 | OBJ B |
| | 18 | HINIT |
| | 19 | |
| | 20 | |
| | 21 | |
| +5V | 22 | +5V |
| | 23 | |
| | 24 | |
| | 25 | |

CN - 1

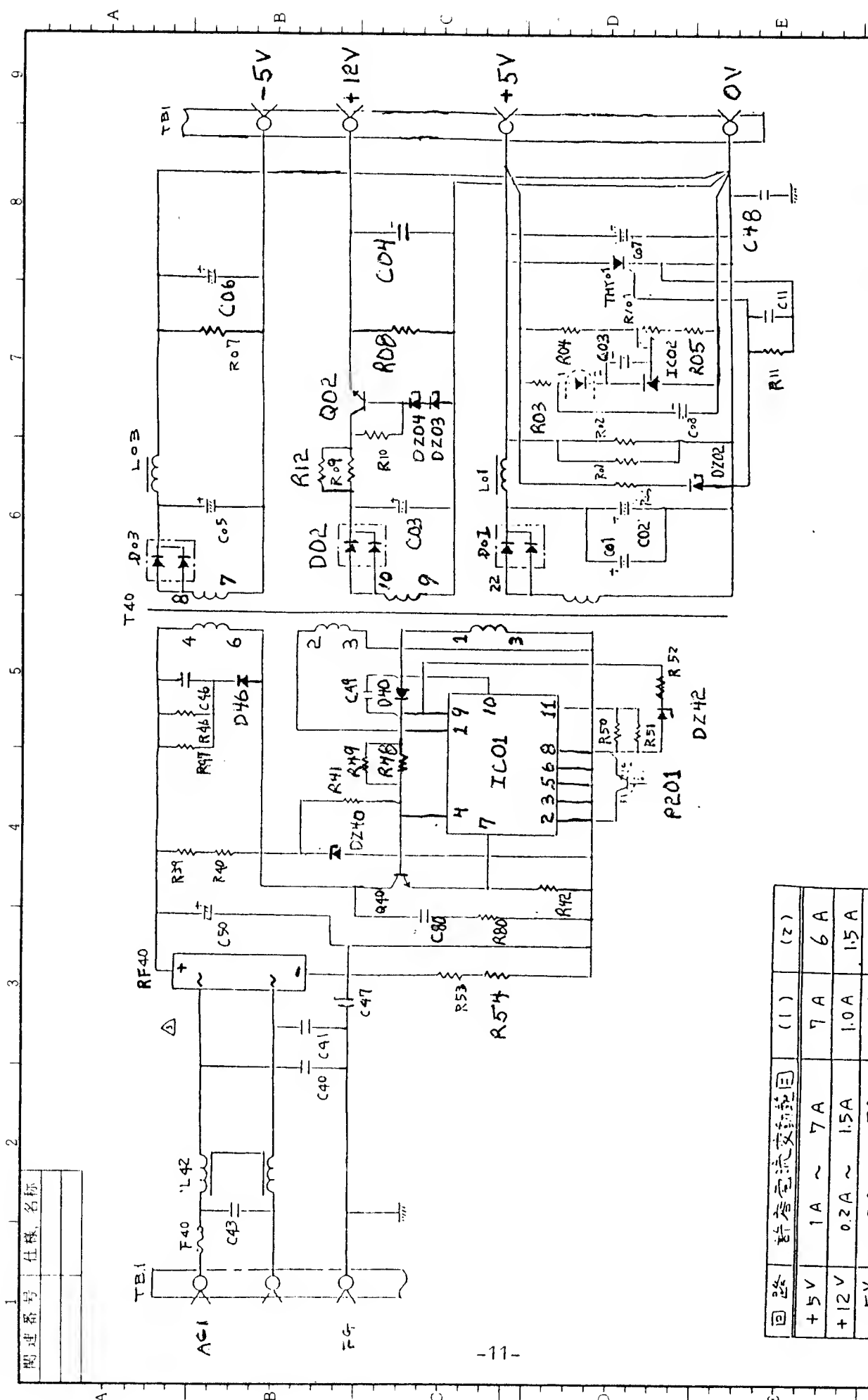
| B | | A |
|-----------------------------|----|------|
| | 1 | DB0 |
| | 2 | DB1 |
| | 3 | DB2 |
| | 4 | DB3 |
| | 5 | DB4 |
| GND | 6 | DB5 |
| | 7 | DB6 |
| | 8 | DB7 |
| | 9 | |
| | 10 | |
| | 11 | GND |
| SCR G | 12 | |
| $\overline{\text{CBCS}}$ | 13 | AB0 |
| $\overline{\text{DBC S}}$ | 14 | AB1 |
| $\phi \text{ SC}$ | 15 | AB2 |
| SCR D | 16 | AB3 |
| SCR E | 17 | AB4 |
| SCR F | 18 | AB5 |
| $\overline{\text{ACL 2}}$ | 19 | AB6 |
| $\overline{\text{OKOUT}}$ | 20 | AB7 |
| $\overline{\text{AKB}}$ | 21 | AB8 |
| $\overline{\text{RQB}}$ | 22 | AB9 |
| $\overline{\text{BLCNTEN}}$ | 23 | AB10 |
| $\overline{\text{WRB}}$ | 24 | AB11 |
| $\overline{\text{RDB}}$ | 25 | AB12 |

JOINT CONNECTOR

85605 - 連貫 - 1 - 2/2



POWER SUPPLY CIRCUIT



| | |
|--------------|------------------|
| 名称 | KGD23SMKII - 3ch |
| POWER SUPPLY | |
| 図番 | WM - 830066 |

| 回路 | 許容電流変動範囲 | (1) | (2) |
|------|-------------|------|------|
| +5V | 1A ~ 7A | 7A | 6A |
| +12V | 0.2A ~ 1.5A | 1.0A | 1.5A |
| -5V | 0.2A ~ 0.5A | 0.5A | 0.5A |

但し出力容量は Total 750W

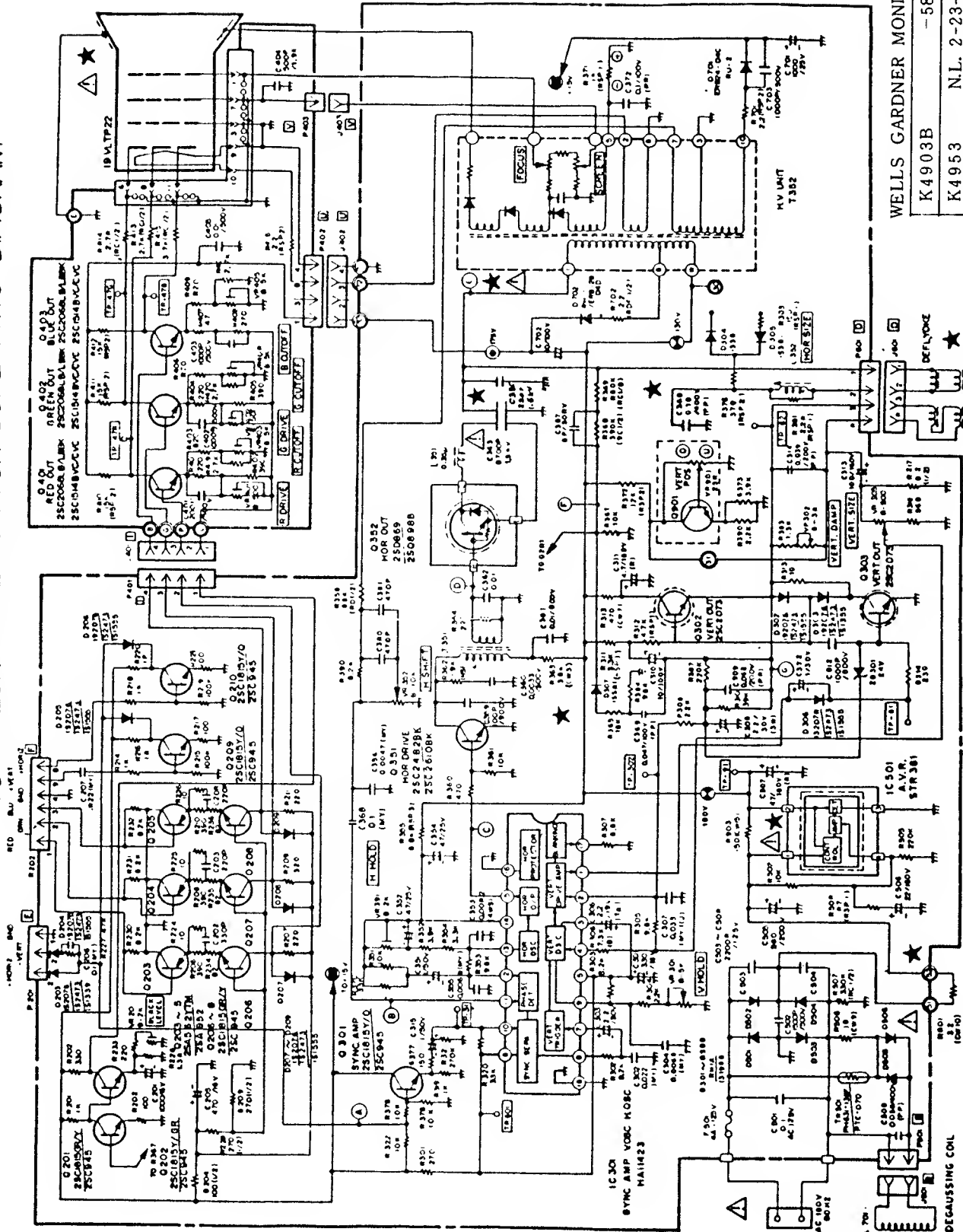
C49は実装しない。

POWER SUPPLY Model KGD23SMK-II

| Item | Parts Nos | Description | Specification | Q'ty | Manufacturer |
|------|-----------|----------------------|-------------------------------------|------|-------------------|
| 1. | F40 | Fuse | GHS 5 | 1 | Nagasawa |
| 2. | T40 | Transformer | | 1 | Shindengen |
| 3. | L42 | Common Mode Choke | UF327S 602Y1RO | 1 | TDK |
| 4. | Q40 | Transistor | 2SC3306 | 1 | Toshiba |
| 5. | RF40 | Bridge Rectifier | S3WB 40 | 1 | Shindengen |
| 6. | D40 | Diode | V19C | 1 | Hitachi |
| 7. | D46 | Diode | V19G | 1 | Hitachi |
| 8. | DZ40 | Zener Diode | HZ16-1 | 1 | Hitachi |
| 9. | IC01 | HB IC | RHD01-2 | 1 | Nichi-con |
| 10. | PC01 | Photo Coupler | PS 2018 | 1 | Nichiden (NEC) |
| 11. | C40, 41 | Ceramic Capacitor | DE7090B 102KVAI 125V 1,000pf | 2 | Murata |
| 12. | C47 | Ceramic Capacitor | — ditto— | 1 | Murata |
| 13. | C80 | Ceramic Capacitor | DE0707B 681K 2KV DC 680p | 1 | Murata |
| 14. | C42 | Film Capacitor | | | |
| 15. | C43 | Film Capacitor | QXM2G 104KT 400V 0.1 μ f | 1 | Nichi-con |
| 16. | C46 | Film Capacitor | ECQ-E2 104KS 200V 0.1 μ f | 1 | Matsushita |
| 17. | C48 | Film Capacitor | ECQ-E6 473KZ 400V 0.047 μ f | 1 | Matsushita |
| 18. | C50 | Electrode Capacitor | LJA2D471 THSCBV 200V 470 μ f | 1 | Nichi-con |
| 19. | R37, 40 | Resistor | ERG-1SJ 393H | 2 | Matsushita |
| 20. | R47, 46 | Resistor | ERG-2SJ 223H | 2 | Matsushita |
| 21. | R48, 49 | Resistor | ERG-3SJ 560H | 2 | Matsushita |
| 22. | R80 | Resistor | ERG-2SJ 330H | 1 | Matsushita |
| 23. | R42 | Metal Plate Resistor | MFC 70 0.22 ohm | 1 | Fukushima Futaba |
| 24. | R53, 54 | Coil Resistor | MNS 05N 1ROJ | 2 | Micron |
| 25. | R41 | Carbon Resistor | 1/4W 10K ohm | 1 | |
| 26. | R50 | Carbon Resistor | 1/4W 680 ohm | 1 | |
| 26. | R51 | Carbon Resistor | 1/4W 12K ohm | 1 | |
| 28. | R52 | Carbon Resistor | | | |
| 29. | L01 | Choke | RD1113A 3J 3uH 10A | 1 | Hokkoh |
| 30. | L03 | Choke | RD810A 3F 3uH 5A | 1 | Hokkoh |
| 31. | Q02 | Transistor | 2SD1022 or 2SD1308 | 1 | Shindengen |
| 32. | D01 | Diode | ESAC 83-004 | 1 | Fuji Denki |
| 33. | D02 | Diode | 5CH2M or ESAC25-020 | 1 | Fuji Denki or NEC |
| 34. | D03 | Diode | — ditto — | 1 | Fuji Denki |
| 35. | DZ02 | Zener Diode | HZ 6B-2 | 1 | Hitachi |
| 36. | DZ03 | Zener Diode | HZ 12B-1L | 1 | Hitachi |
| 37. | THY01 | Thyristor | 5PIM or SF5B4I | 1 | NEC or Toshiba |
| 38. | IC02 | I.C. | TL431 CLP | 1 | T.I. |
| 39. | C01, 02 | Capacitor | SXA 16VB 2200 | 2 | Nichi-Chemi |
| 40. | C03, 05 | Capacitor | CEUSM 1V 471 35V 470 μ f | 2 | Nichi-con |

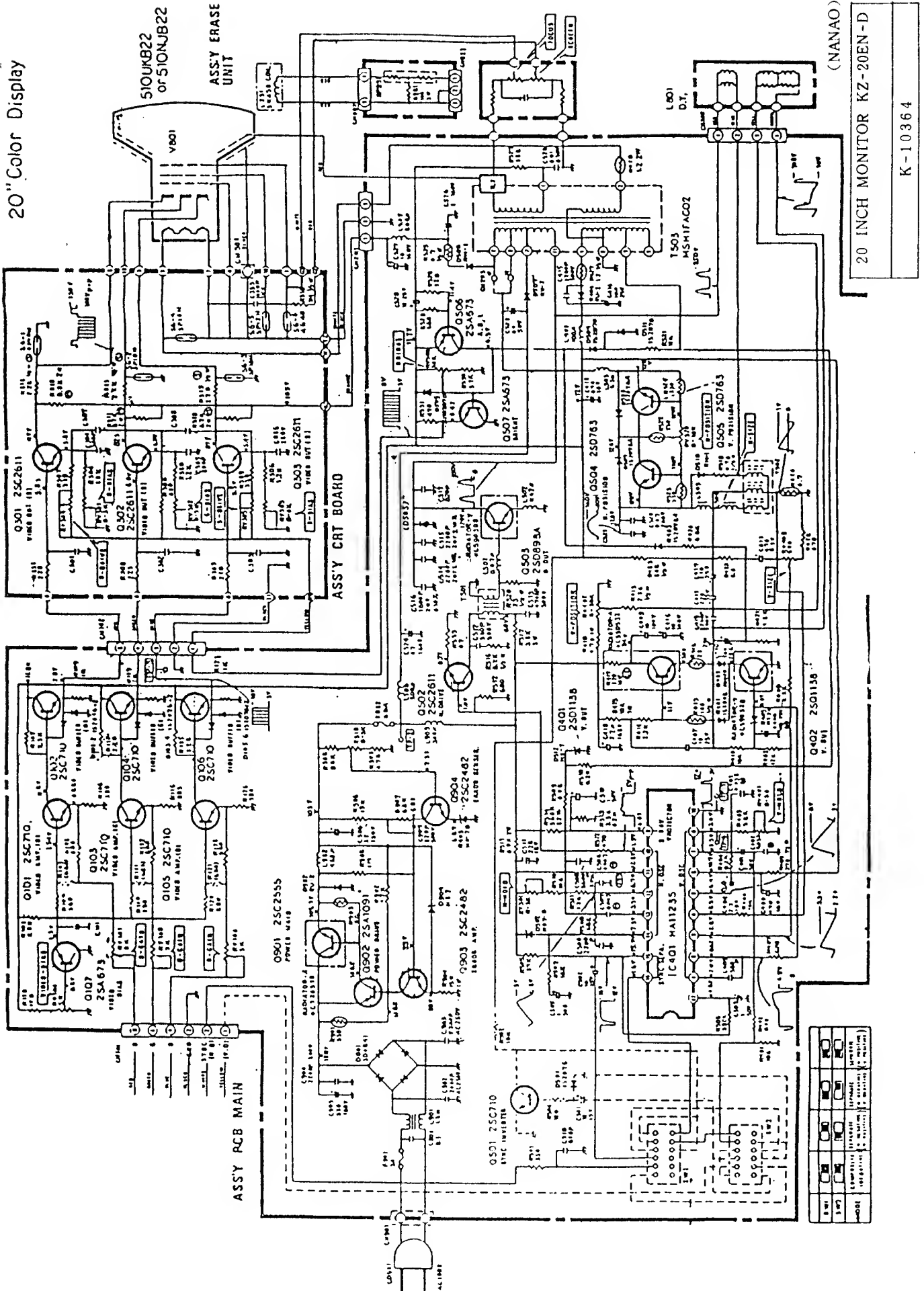
| Item | Parts Nos | Description | Specification | Q'ty | Manufacturer |
|------|-----------|-----------------|----------------------------------|------|----------------------------|
| 41. | C04 | Capacitor | CEUSM 1E 331 25V 330 μ F | 1 | Nichi-con |
| 42. | C07, 06 | Capacitor | CEUSM 1E 331 25V 330 μ f | 2 | Nichi-con |
| 43. | C08 | Capacitor | CEUSM 1H 010 | 1 | Nichi-con 50V 1 μ f |
| 44. | C09 | Capacitor | CEUSM 1V 4R7 35V 4.7 μ f | 1 | Nichi-con |
| 45. | C11 | Film Capacitor | TDY1H/2A 104K 50V 0.1 μ f | 1 | Nichi-con |
| 46. | R01, 13 | Resistor | ERG 3SJ 680H | 2 | Matsushita 3W 68 Ω |
| 47. | R08 | Resistor | ERG3SJ 271H | 1 | Matsushita 3W 270 Ω |
| 48. | R09 | Resistor | ERG 2SJ R68 2W 0.68 ohm | 1 | Matsushita |
| 49. | R10 | Resistor | ERG 1SJ 271 1W 270 ohm | 1 | Matsushita |
| 50. | RV01 | Volume | EVM38GA 00B52 500 ohm | 1 | Matsushita |
| 51. | R03 | Carbon Resistor | 1/4W 68 ohm | 1 | |
| 52. | R04, 11 | Carbon Resistor | 1/4W 560 ohm | 2 | |
| 53. | R05 | Carbon Resistor | 1/4W 390 ohm | 1 | |
| 54. | R06 | Carbon Resistor | 1/4W 15 ohm | 1 | |
| 55. | R02 | | | | |
| 56. | | P.C. Board | | 1 | |
| 57. | TB1 | Terminal Strip | | 1 | |
| 58. | | Terminal | Faston | 7 | |

19" COLOR GAME MONITOR SCHEMATIC DIAGRAM

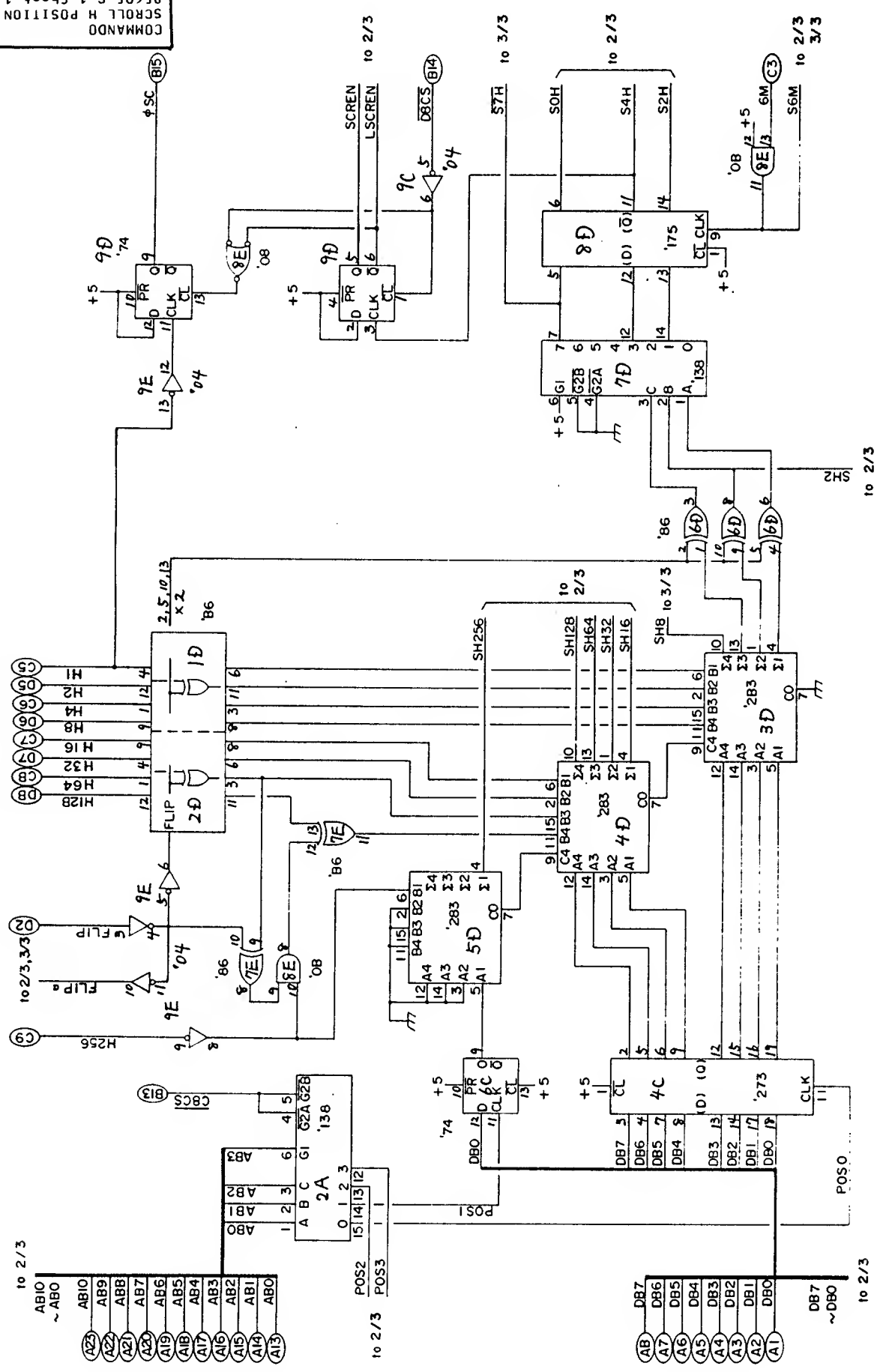


WELLS GARDNER MONITOR
K4903B - 5844
K4953 N.L. 2-23-84

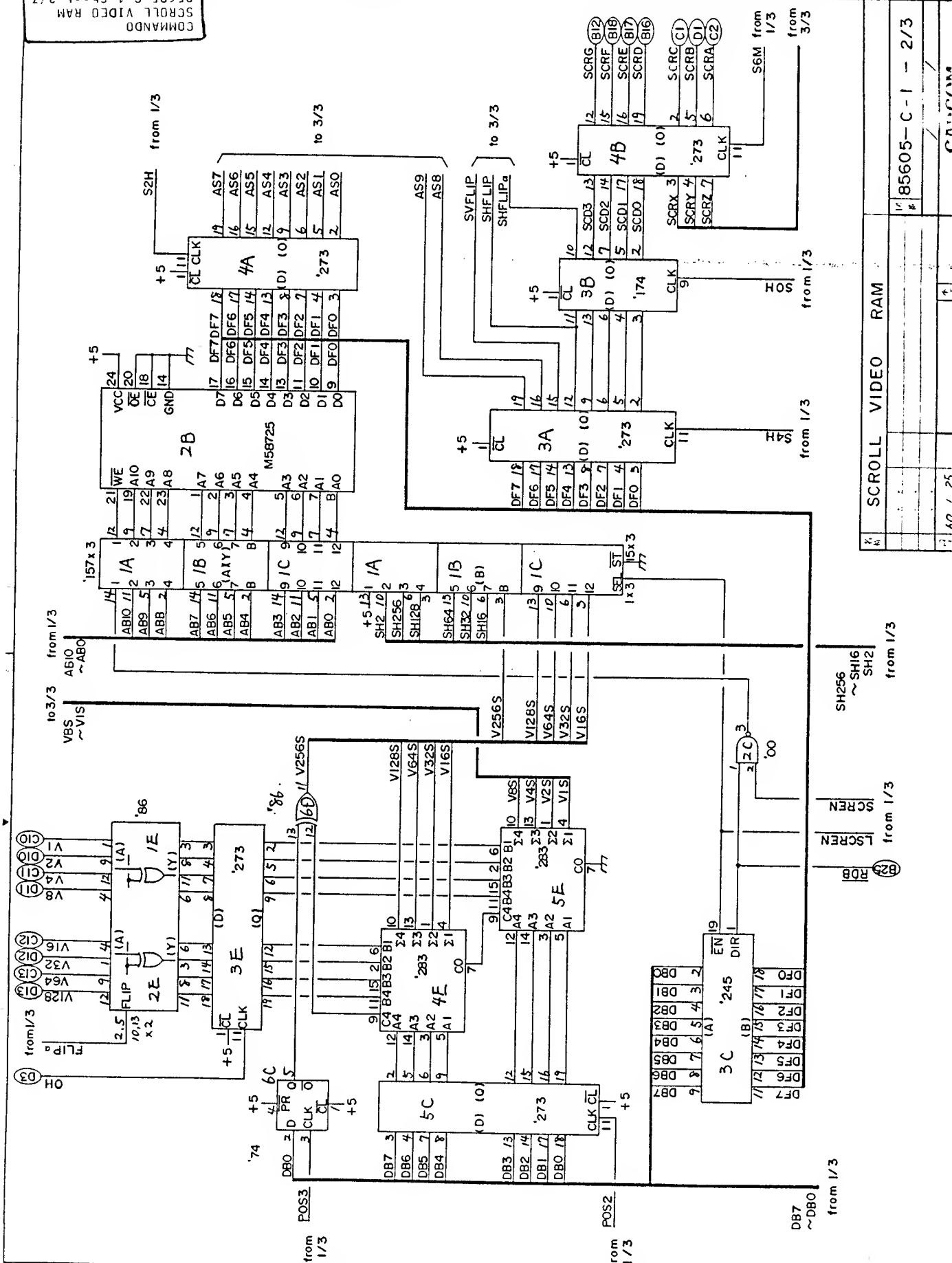
20" Color Display

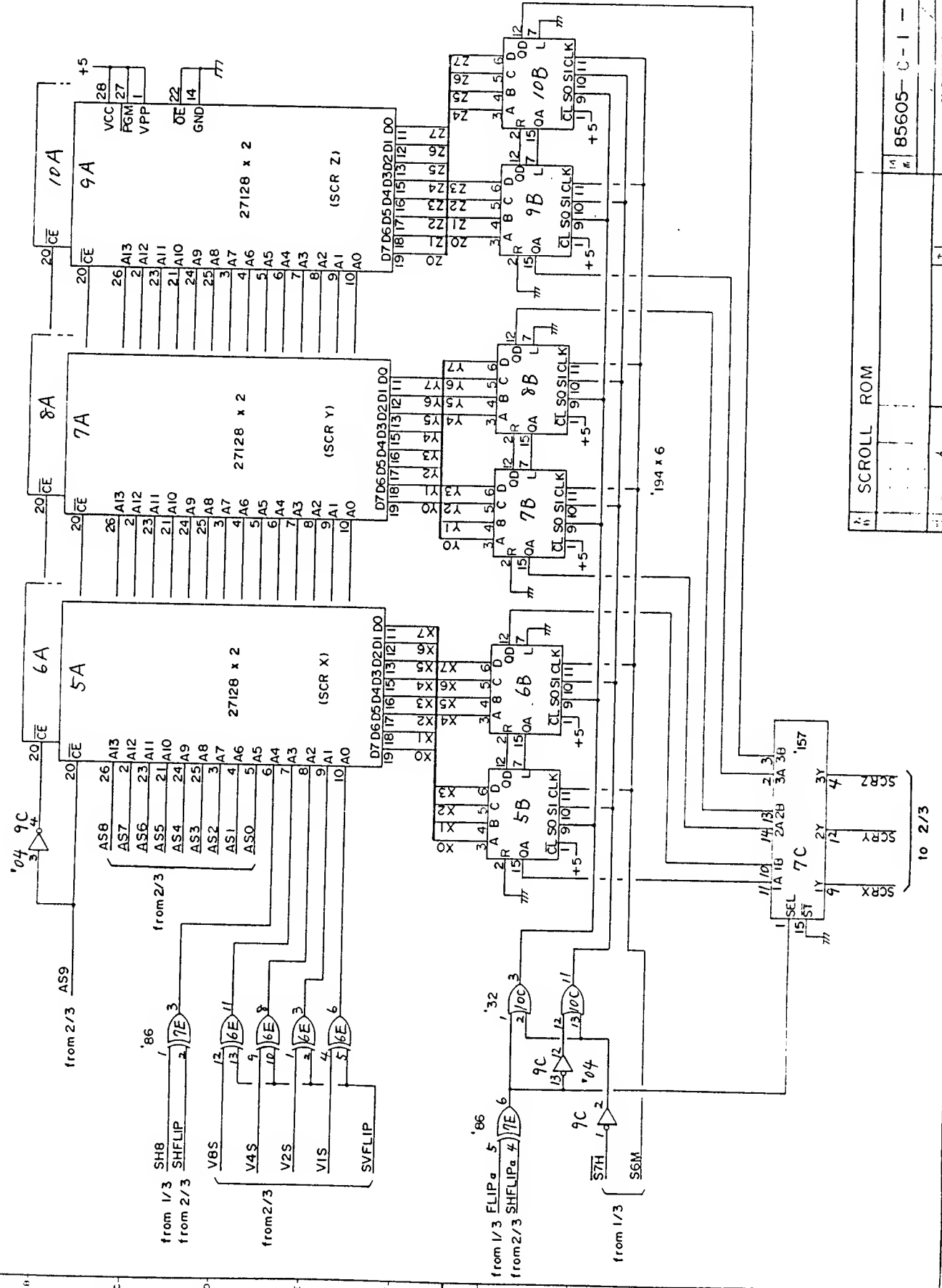




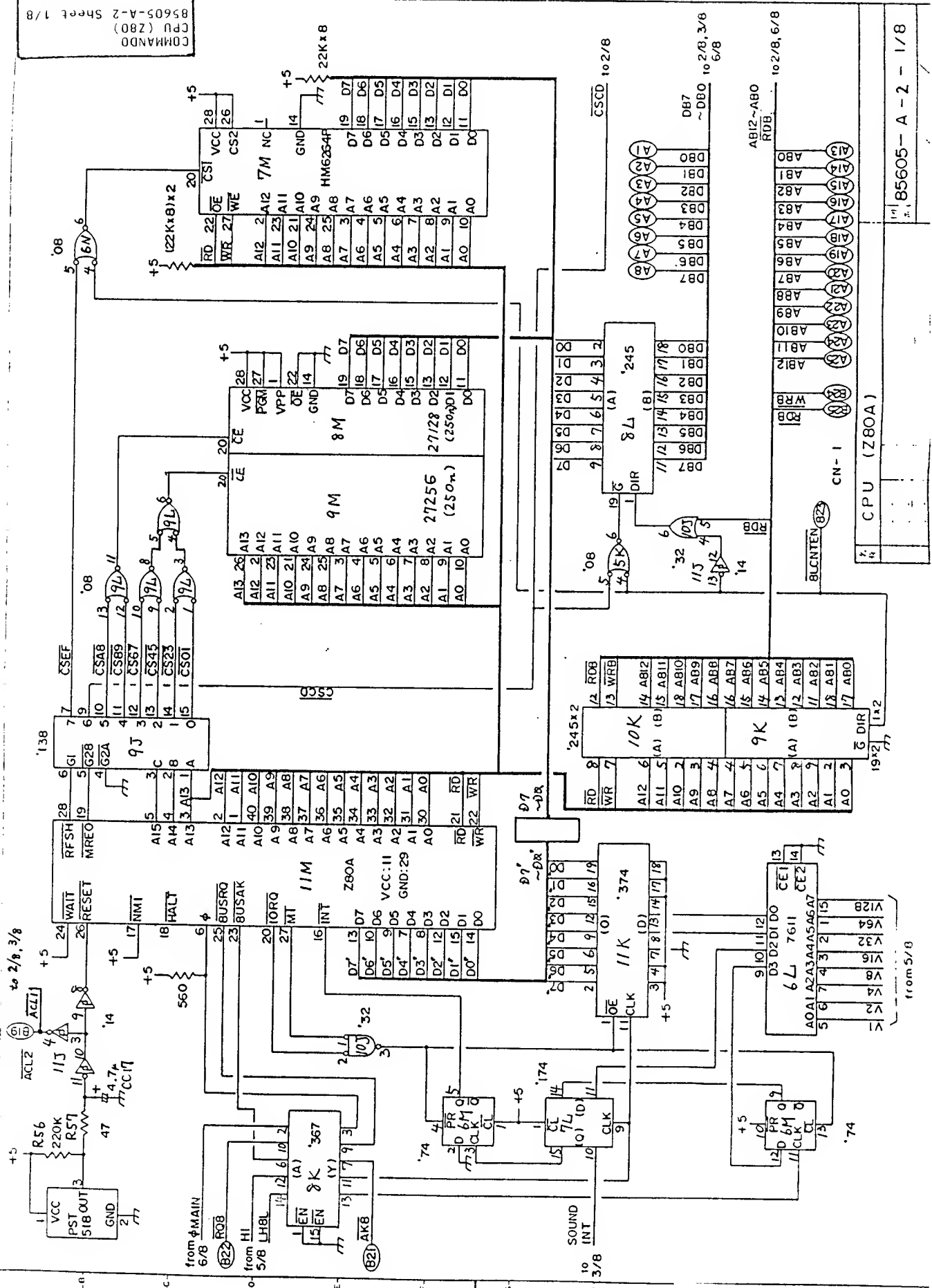


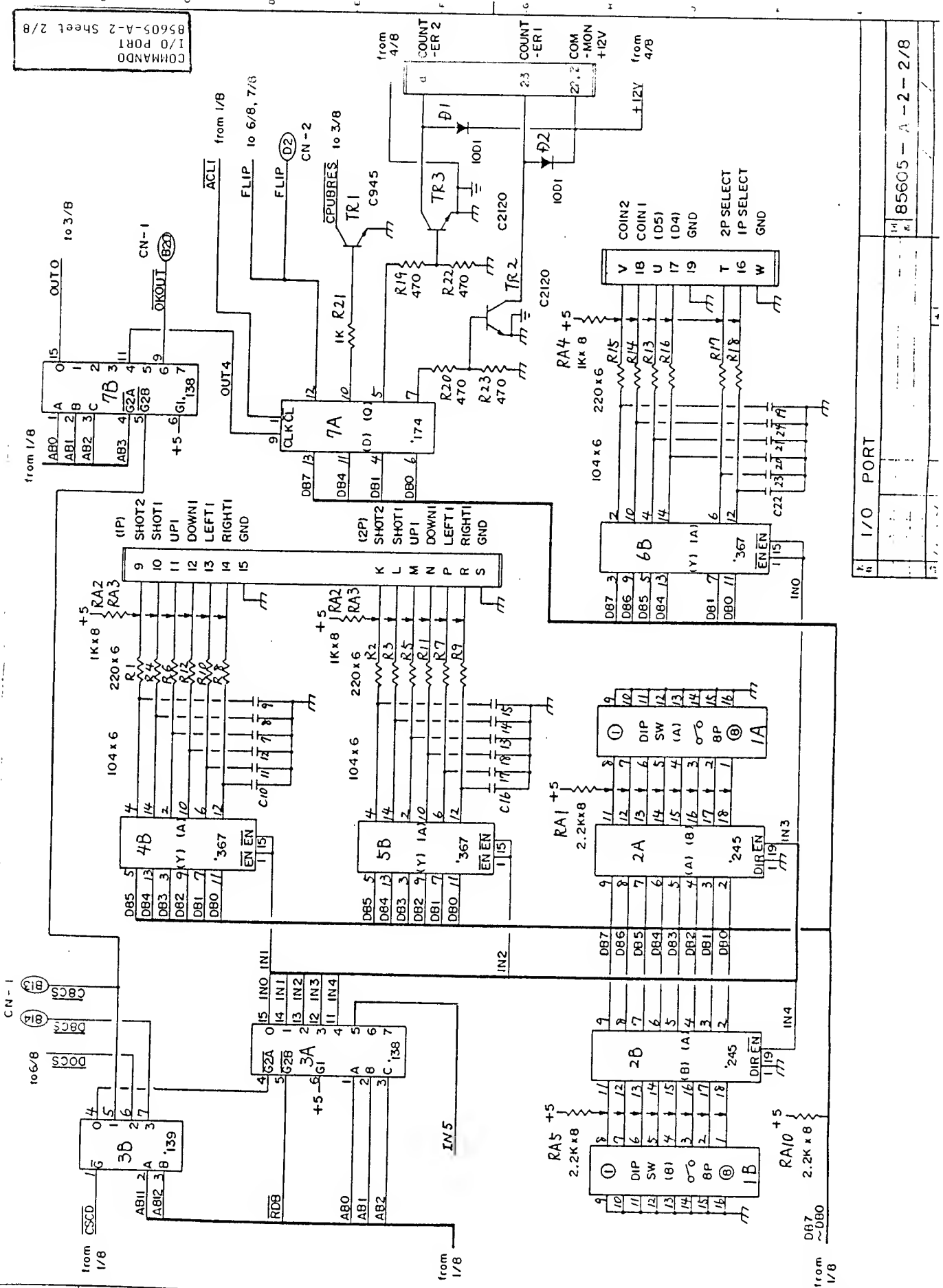
| | | |
|-------------------|-------------------|----------|
| SCROLL H POSITION | 85605 - C-1 - 1/3 | COMMANDO |
| 4 / 15 | | |





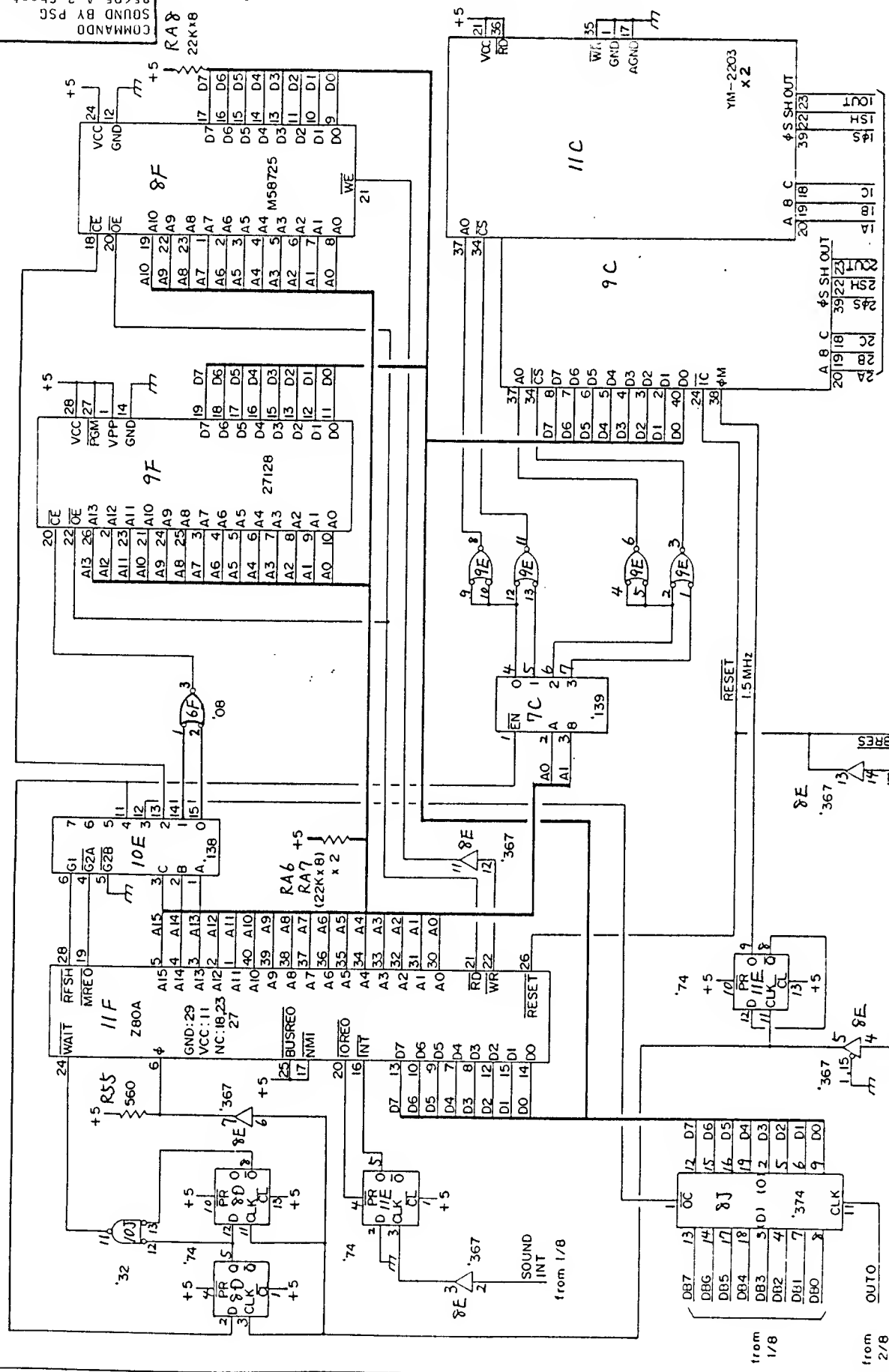
| COMMAND | |
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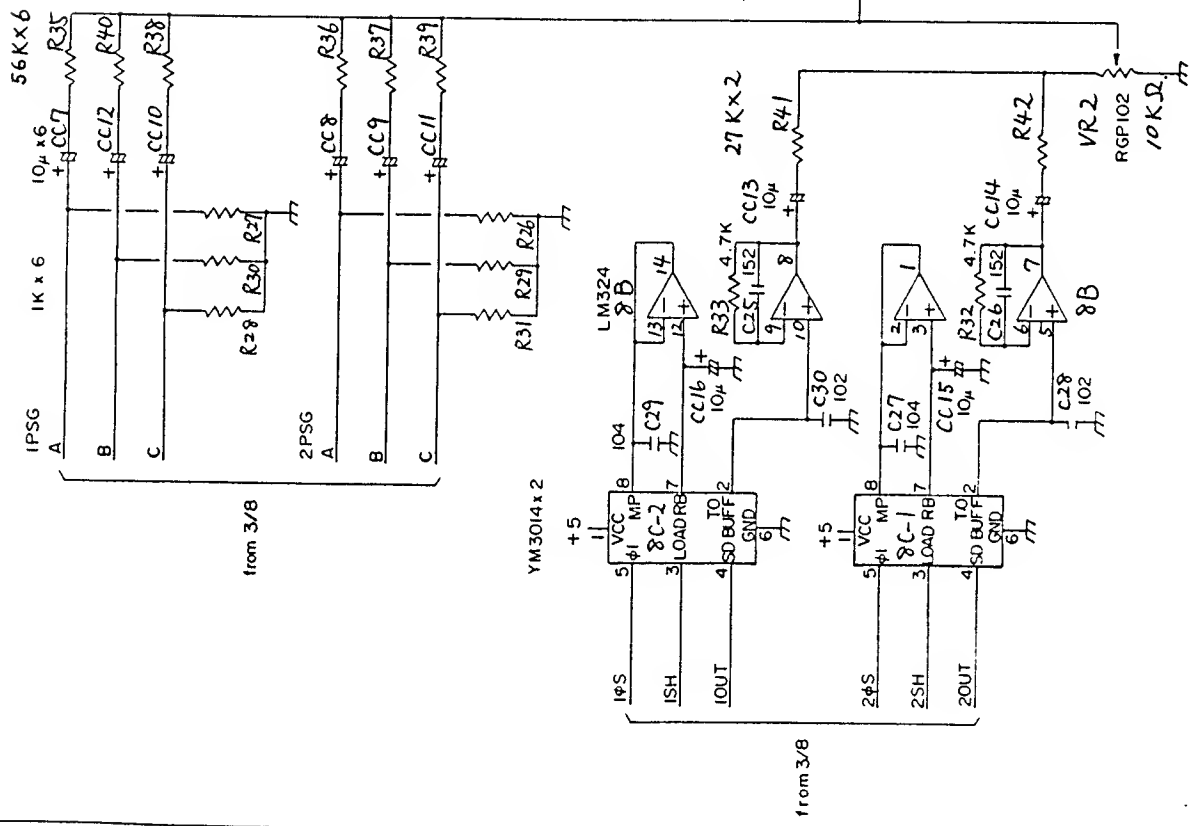
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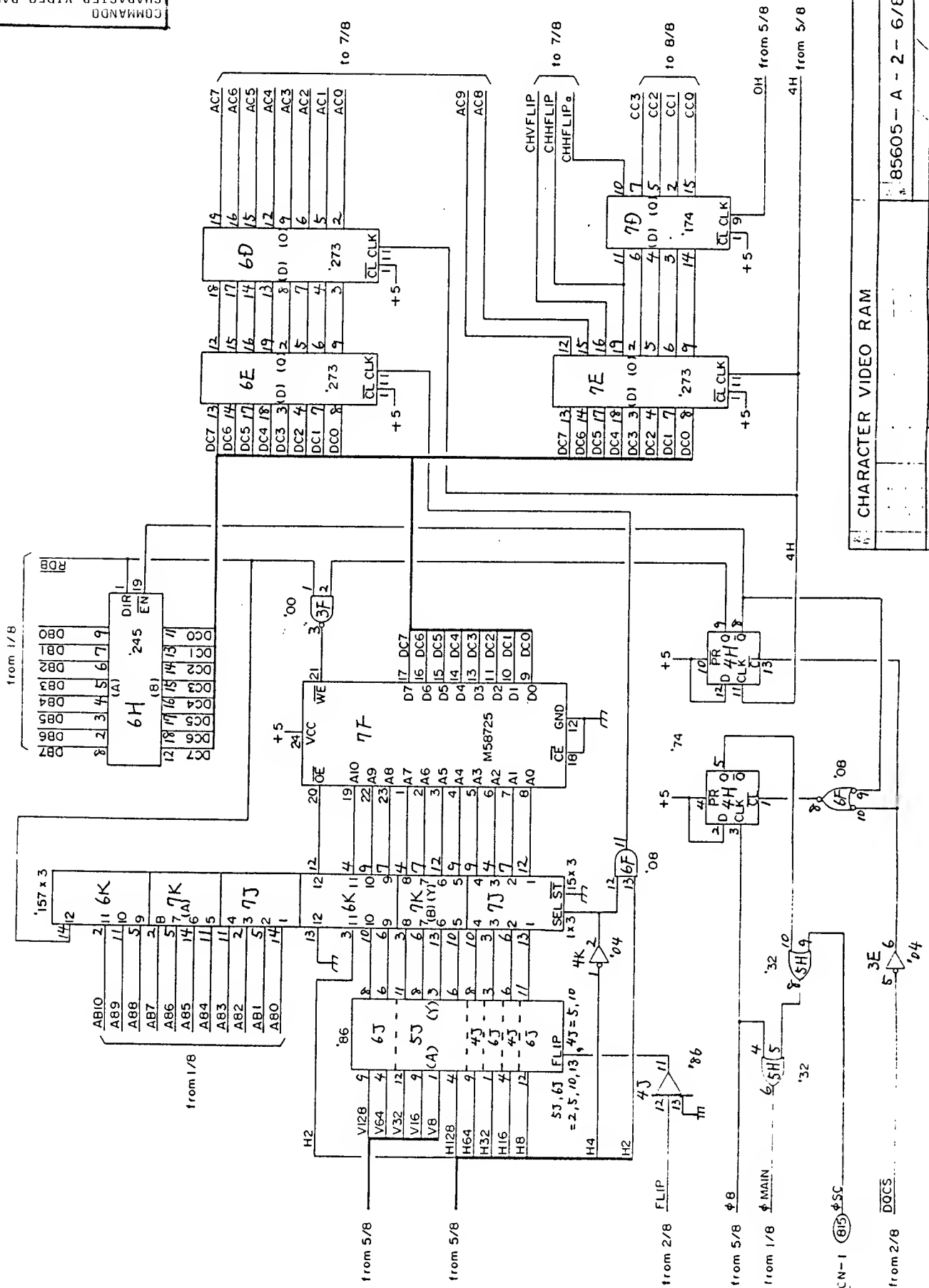


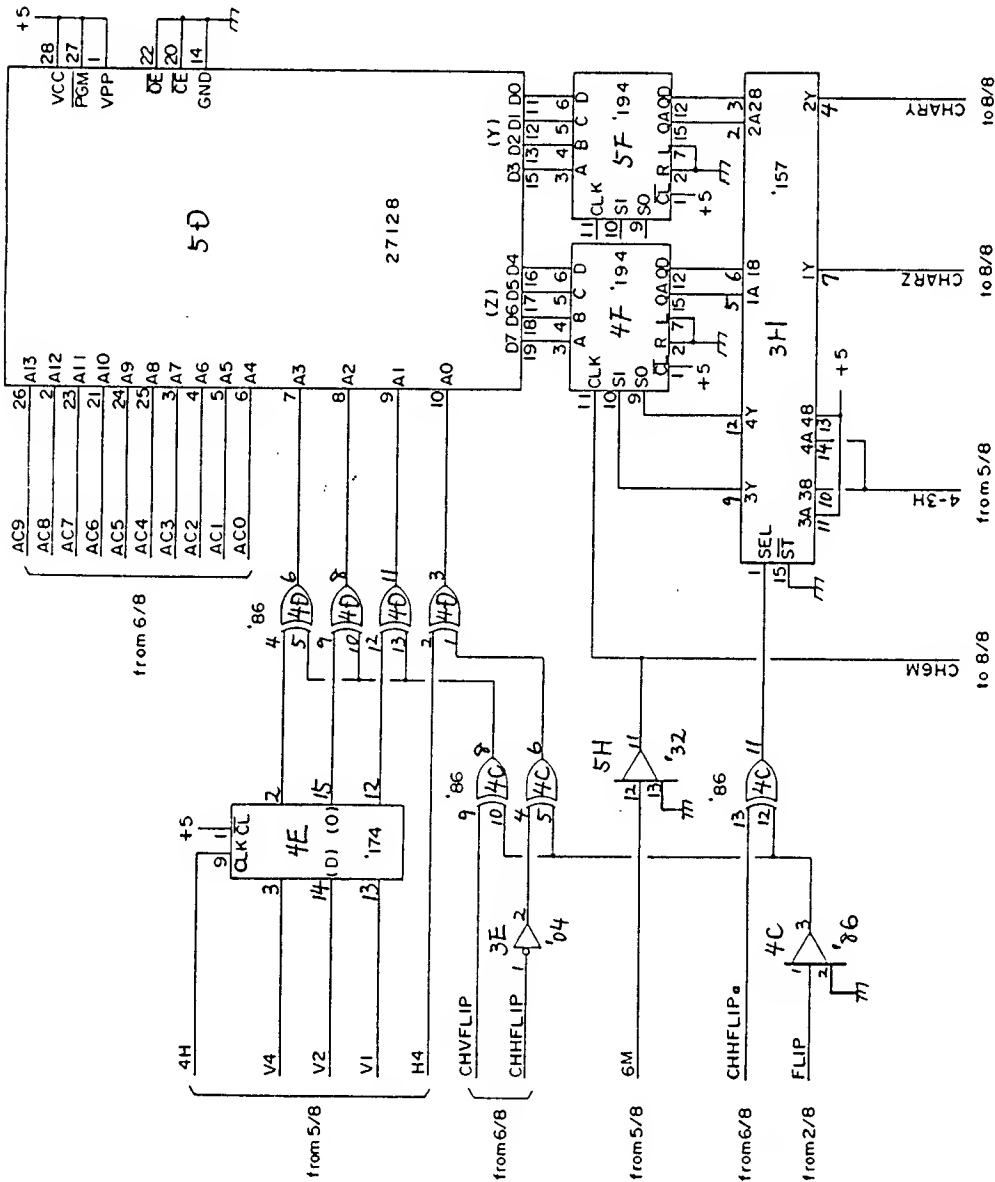
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| MAIN AMP | |
|---------------|---------------------|
| 60.4.1 | R35~R40 33K→56K 独統値 |
| 4.1 | R41, R42 33K→27K 変更 |
| 85605-A-2-4/8 | |

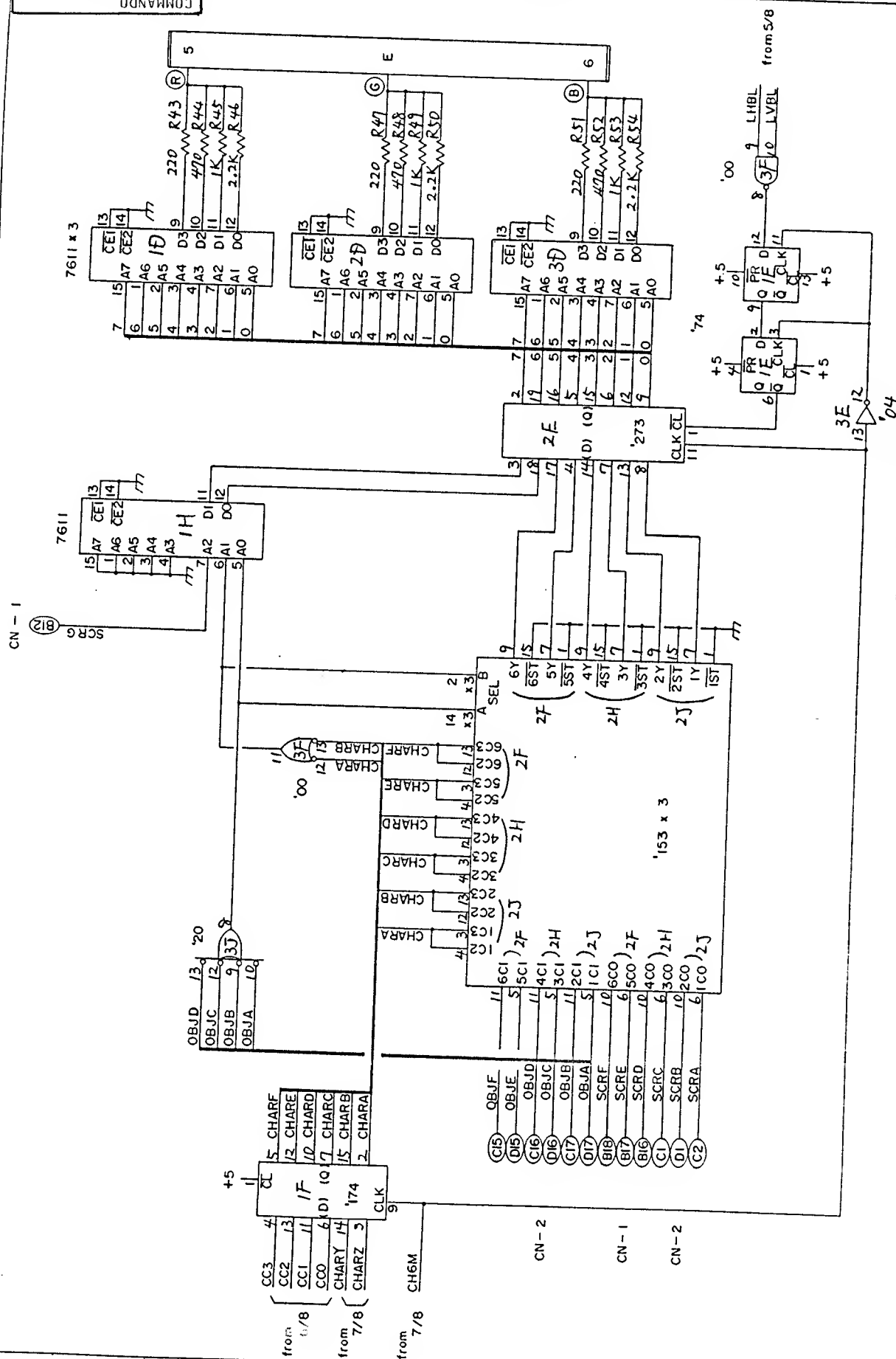




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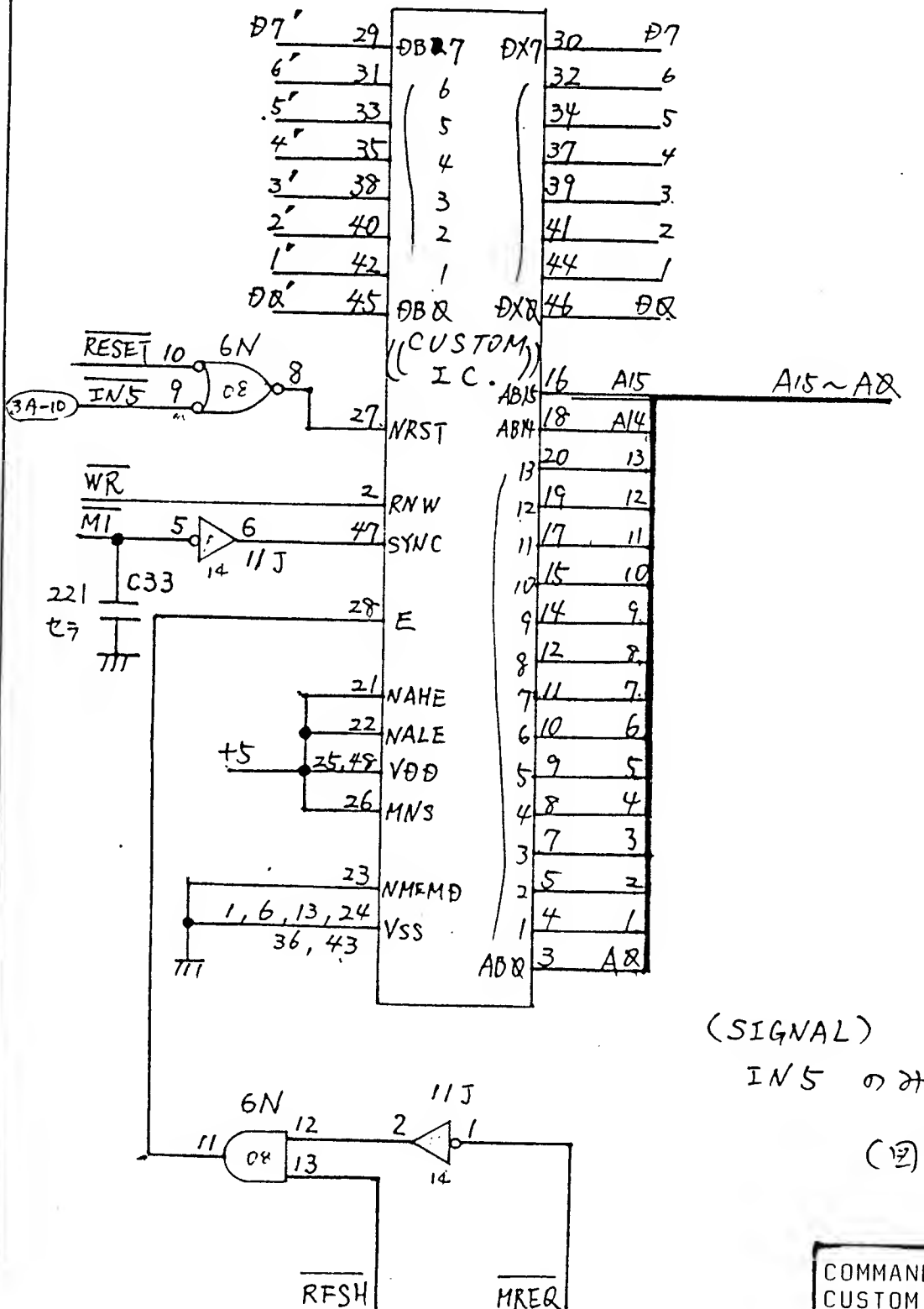
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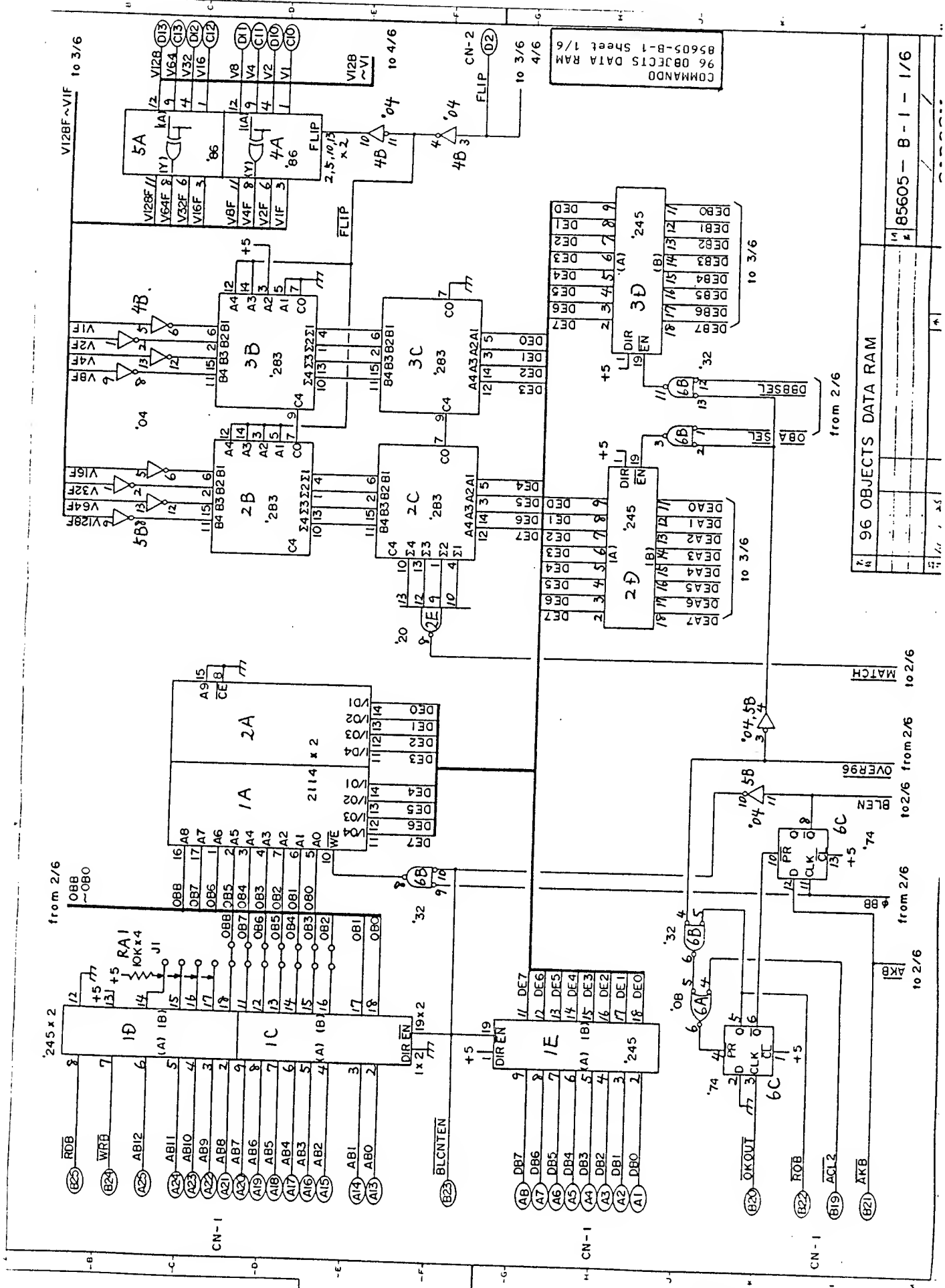
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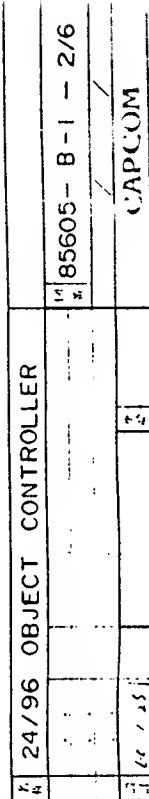
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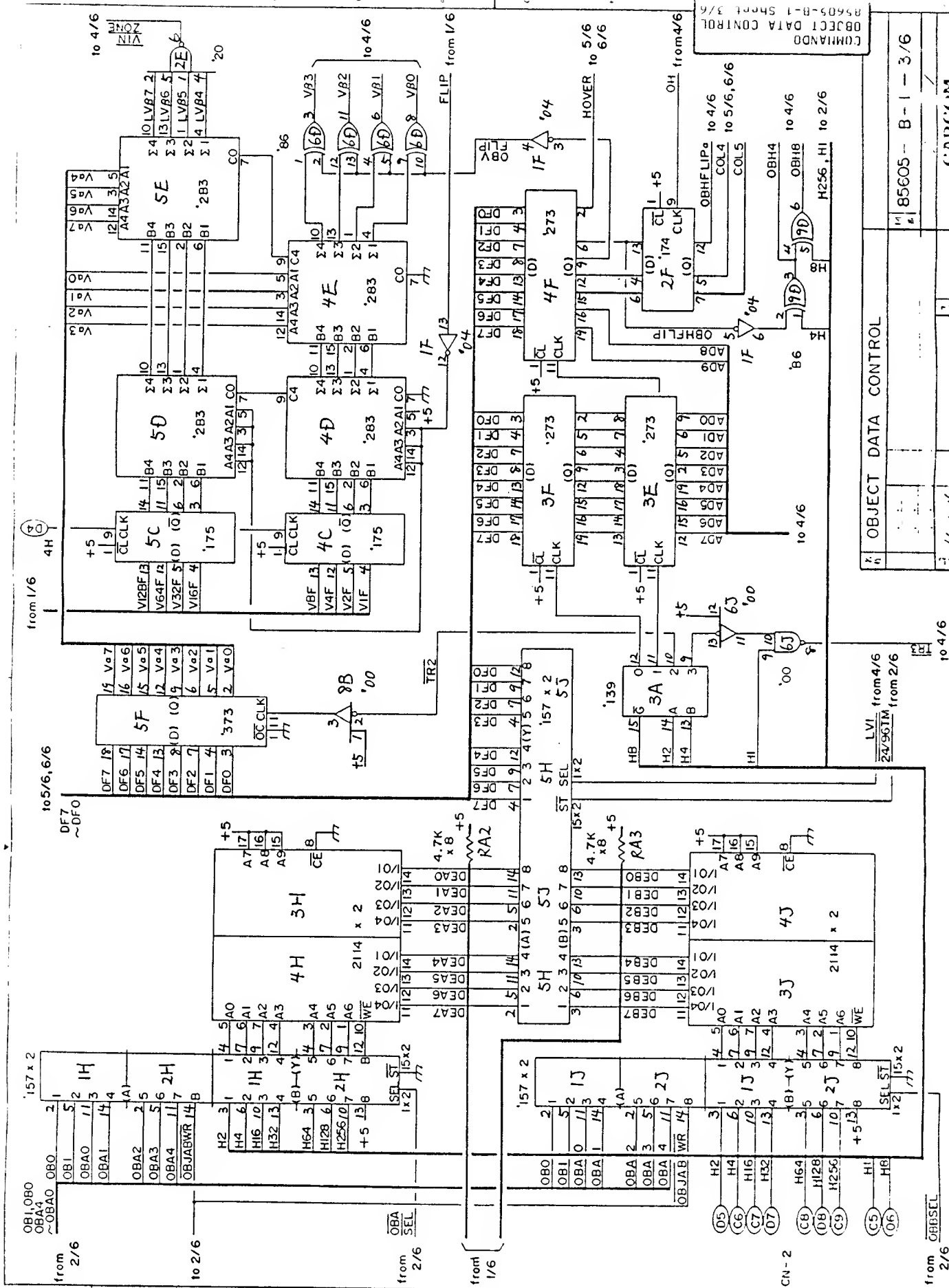


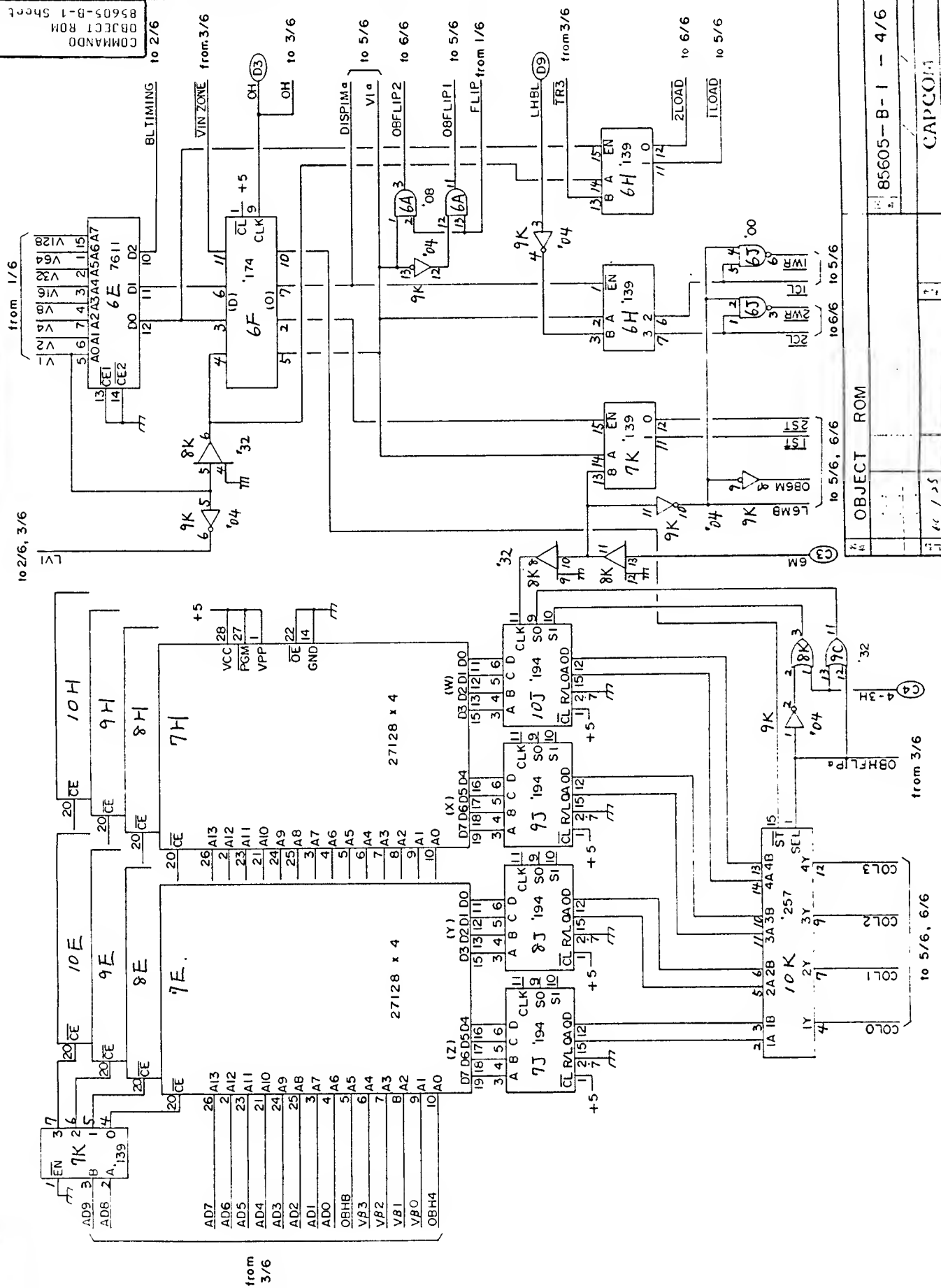


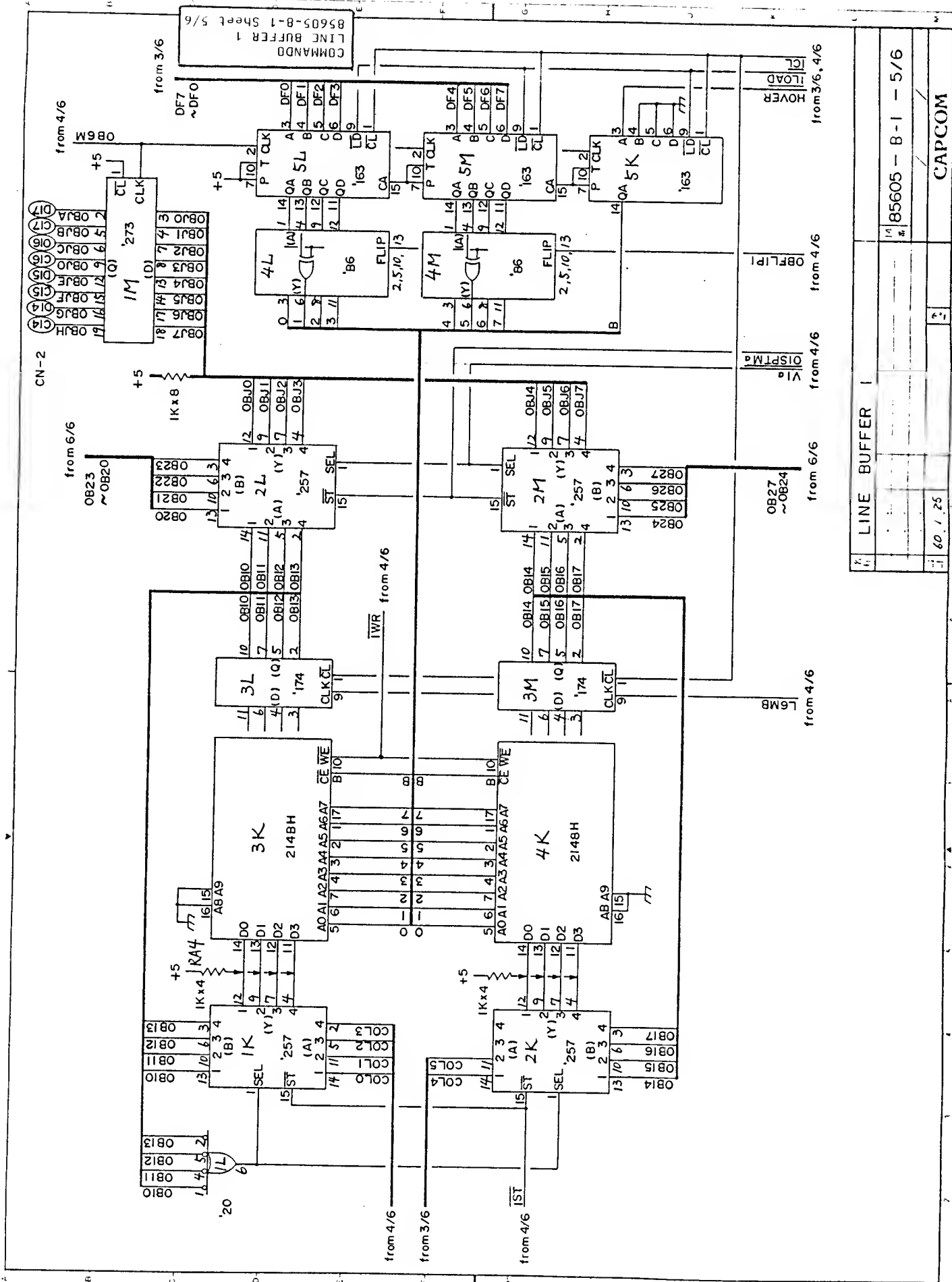
85605-B-1 Sheet 1/6

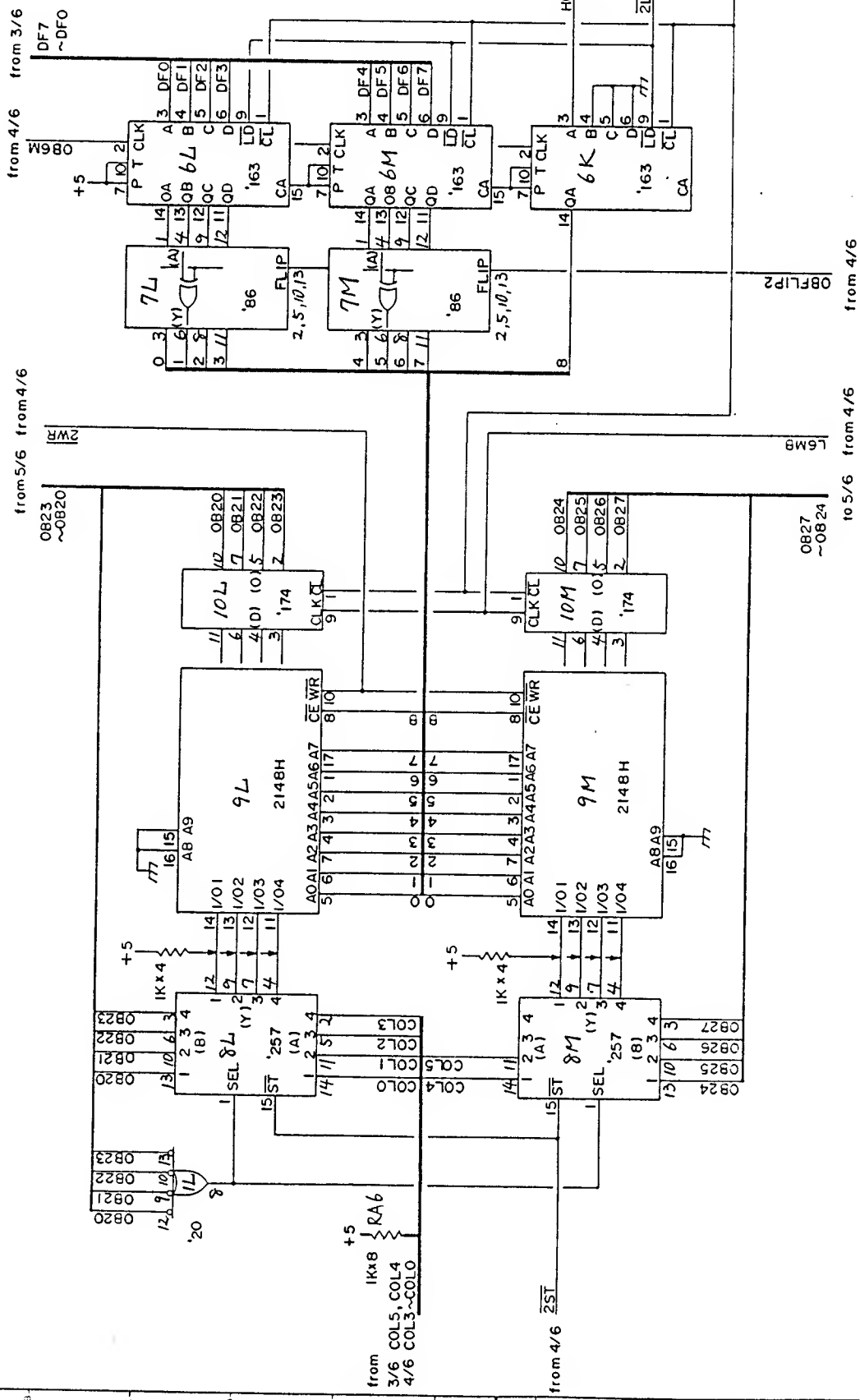
| 96 OBJECTS DATA RAM | |
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| LINE BUFFER 2 | | 85605-B-1 - 6/6 | |
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| 85 | 86 | 87 | 88 |
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| 97 | 98 | 99 | 100 |

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Data East USA, Inc. ("Seller"), warrants only to the initial purchaser of its products that the items listed below are free from defects in material and workmanship under normal use and service for the warranty periods specified:

- | | |
|---------------------------|-----------|
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| B. Television monitor | (30) days |

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- A. Seller is notified promptly upon discovery by buyer that stated products are defective.
- B. Such products are properly packaged and then returned, prepaid to Seller's plant.

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